

The Ed Tech Revolution is about to become the **Learner Revolution**

Education Design Lab



Steve Wattenmaker's startup, csMentor, has created a mobile, video-based mentoring system that improves outcomes for at-risk college students. He has taken csMentor through two years of trials with the Bill & Melinda Gates Foundation, he has attracted support from the Rand Corporation, he has worked with two universities, and he is constantly scrambling to apply for grants. Wattenmaker has succeeded in getting attention, but not from venture capital investors.

"The areas in education that are getting money are really at the surface level with quick returns," said Wattenmaker. "But areas that need addressing aren't getting much investor attention."

Wattenmaker's puzzlement is familiar to the many entrepreneurs behind early-stage companies with products designed to demonstrate that the convergence of advances in technology, learning science, and consumer demand are about to unleash the next education revolution.

Learner Revolution

learner-driven
ecosystem

credit portability

competency-based
credit

21st century skill
assessment

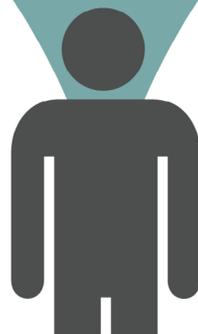
real-world
learning labs

skills specific
academies

adaptive learning
& feedback

facilitated peer
learning

learner coaching



Revolution Leaders

Break-out companies leading this revolution will refine and utilize the platforms — software, mobile, analytical — to create products and services that will reach out to individual learners, define pathways for their success, and travel down that path with them.

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Billions of dollars¹ keep flowing into education technology, but most of it has flowed to predictable places. In higher education, the investment has come in two waves — the first established the many online colleges as well as the learning management systems that now form the digital academic infrastructure of traditional colleges and universities. The second wave has been focused on courseware tools, data analytics and dashboards, and software platforms.

That second wave continues. According to CB Insights, in 2014 [investment has been focused](#) on companies working in mobile, analytics, software, and building coding academies and boot camps. The leading categories of investments were [very similar in 2013](#).

Now that venture capital has flooded most of the obvious ideas, the third wave of investment opportunities will be more complex — a revolution that will be more transformative. The set of companies poised to break out will refine and utilize platforms — software, mobile, analytical — to create products and services that will reach out to individual learners, define pathways for their success, and travel down that path with them. Let's call it the “learner revolution” characterized by accessible, affordable, customizable, transparent services from post-secondary providers, be they old school or new school.

It needs to happen quickly. The U.S. is looking at a [deficit of 16 million qualified workers](#) by 2025. Many of the new jobs to be created will require more than a high-school diploma. That need

¹ Using various sources, including venture capital funds and Ed Surge, an estimated \$9 billion to \$13 billion has been invested in education technology since 1999. This figure includes both K-12 and higher education.

cannot be addressed by getting more high-school graduates to attend college; the high-school age population will barely grow in the next decade. The answer is almost assuredly retraining existing workers and the [31 million or so Americans who have gone to college but left without a degree](#) or certificate. Those potential students are intimidated by the higher education system and need an array of services, such as mentoring, portability of credits, and competency-based education to lure them back to college.

These are difficult businesses to create. They seek to answer difficult learning-science questions around self-confidence and persistence. They traffic in areas — like student advising, financial aid, and determining adequacy of prior credits — that the traditional higher-education system has long thought of as some of its core services. And it is difficult to show success. For example, [an analysis of the more than \\$50 million given by the Gates Foundation](#) to companies developing digital courseware concluded “the challenge of reliably achieving positive outcomes at scale remains a major issue,” and “courseware effectiveness research that has been done thus far tells us little about whether digital courseware contributes in the long run to degree completion, the foundation's ultimate goal.”

Still, answering the conundrum of how to lift low-attaining adults to a higher standard of living may be the most important educational challenge there is.

The traditional higher-education system is being disaggregated and new models are emerging for achieving degrees and job credentials. This paper will look at where those opportunities lie in the current market. It will also predict some possible

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pathways for getting more attention and investment to those companies. The Gates Foundation, for example, sensing a flagging interest in the venture capital community, is planning more direct investments in what it sees as promising companies, on top of the grant programs it will continue to run.

The Market and the Opportunities

Numerous factors are causing deep disruption in the current higher-education system: public institutions are having their appropriations cut by state governments, private institutions have raised tuitions but many have been unable to increase net revenue, collective student debt is now greater than credit-card debt, and colleges and universities are seeing sudden and potentially catastrophic [drops in enrollment](#). Moody's

Investors Service, the credit-rating agency, has had [a negative outlook](#) for at least part of the higher-education industry since 2009. It reiterated its negative outlook in July.

Outsiders have been forecasting for years a sudden demise of the traditional higher education system. While great structural change is likely, how quickly and how wide ranging it will be is a matter of great conjecture.

Take, for example, the opinions of three venture capitalists and entrepreneurs in education technology firms.

“Higher education is the largest segment of the economy that is going to be transformed over the next ten years,” said Ryan Craig, managing director of University Ventures, predicting the most aggressive change. “Higher education in ten years will be making more money from [job] placement than from tuition.”

Chris Hoehn-Saric, a co-founder and senior managing director of Sterling Partners, is more circumspect. “There are professional requirements in place to qualify to be in many professions,” he said. “The currency of the land is certificates and degrees, and some of those requirements are codified in state law. I’m not saying that it will never change, but that adds a lot of friction to the speed of change.”

John Katzman — who founded 2U, which creates online learning programs for universities, and now leads Noodle, a company that match-

es students with the schools, programs, resources, and experts they need to succeed — believes many mid-level colleges will be shuttered, but isn't convinced the current higher education system needs to be fundamentally overthrown.

“The notion that colleges are inefficient and that a new set of colleges would be more efficient: I buy it,” said Katzman. “I also buy the idea that among existing colleges, some could be more efficient and show others how they can do it, too.”

No matter how quickly the higher education system changes, the learning revolution is based in five broad categories: Cost, the credit-hour struc-



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ture, accreditation and regulation, pedagogical innovation, and defining evolving employer needs.

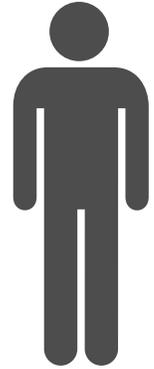
Combatting Cost

Nearly every traditional college campus in America is duplicative of the next one. In general, each has its own department of chemistry, of philosophy, and of education. Each has its own library, its own dorms, its own recreation facility, and its own police force.

The higher-education business model never called for sharing or cooperation with others. Each college and university could advertise that students could get whatever they needed on one campus. Also, by including every possible class and service, each institution could, in theory, control the quality of the experience and education. That model has worked for years, and was sustainable as long

as it was affordable. The problem is it is not affordable any more.

As states have cut funding for higher education (by 23 percent from 2007–12), public universities have sought to make up by raising tuition (up 27 percent during that same period, when adjusted for inflation). Annual tuition at a four-year public university, which averaged [\\$3,500 just over a decade ago](#), now averages \$9,000 for in-state students. Average salaries have not kept up, so students have gone increasingly into debt to pay for tuition. [Outstanding student debt in the U.S.](#) now tops \$1.2 trillion.



Traditional universities are cutting administrative costs wherever they can find them, but their model hamstringing them. The tenure system at many universities, and the research infrastructure at the largest ones, carries overhead that cannot be cut without drastic changes. Some universities are turning increasingly to online education and competency-based learning to lower instructional costs, but nimble early entrants with marketing expertise are quickly outpacing them.

The Credit-hour Structure

Measuring a student's time spent in classes and completing the required work does not guarantee subject mastery. That "seat-time" concept is an imperfect proxy for knowledge gained, but it is the only proxy higher education has.

"The nice thing about the credit hour system is it is easy to understand. Either someone sat in the seat and they passed the course, or they didn't,"

SAMPLE COMPANIES

Cost

Straighter Line — Provides online college-level courses in numerous subjects at a far lower cost than traditional colleges.

Minerva — An elite standalone university that offers a global education for an annual tuition of \$10,000.

American Honors — An honors program offered at selected community colleges which markets a more rigorous and low-cost two-year degree and help transferring to selective four year colleges.

Flat World Education — Creates low-cost textbooks and online platforms where teachers and institutions can offer personalized content.

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SAMPLE COMPANIES

Credit Hour

Course Maven — Has created a mosaic of courses from different institutions that students can take to earn a degree. Now working on a system to measure whether individual courses are equivalent to one another.

Degreed — Measures academic, professional, and lifelong learning, and creates a profile for individual students.

Pathbrite — Helps users create online portfolios to show accomplishments: academic, career, technical, and creative.

said Janet Van Pelt, founder of CourseMaven, a company that has created a matrix of college courses from different providers. “At some point the measurement system has to change.”

Credit hours are specified by accreditors and regulators to define what a successful academic program must include. Individual colleges and universities have great latitude and power in deciding whether to accept credits from other institutions.

“40 percent of students lose 100 percent of their credits when they transfer,” said Van Pelt.

Students have complained for generations that they are forced to take classes covering material they already know. Competency-based education, micro-credentialing, and academic badges are efforts to address those complaints.

Imagine a world where credits are not institution bound, but earned and carried by individual students throughout life. There may be no other educational innovation that would be more empowering for students. The key will be arriving at

definitions of accomplishment that are as easy to understand as the credit hour.

Accreditation & Regulation

Traditional colleges and universities may not like the demands of accreditors and regulators, but they like the fact that the system exists. It has put up large barriers to other competitors, and made higher education something of a closed loop.

SAMPLE COMPANIES

Accreditation & Regulation

General Assembly — Part-time and full-time classes online and in-person taught by practitioners to those who want to join the same occupation.

Codecademy — Bypasses formal higher education by instructing students in basic computer coding so they have a lucrative career path.

Coursolve — Connects global students and organizations through digital internships.

Accrediting visiting teams are made up of peers from other similar institutions. One hand washes the other, or at least it appears that way from the outside.

Accrediting bodies’ requirements have led to much of the duplication seen on college campuses. Universities must have certain levels of faculty who possess terminal degrees, a certain number of library volumes, and specified levels of other resources.

The net result for students is a monolithic system

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of colleges and universities that are forced by regulators' and accreditors' rules to be essentially alike. As a workaround, entrepreneurs are beginning to create their own universities or training academies outside the formal higher-education system. By creating their own content and educational platforms, they are hoping to also crack the traditional system's credit-hour stranglehold.

Pedagogical Innovation

Decades of research shows a [yawning gap](#) between the way people are taught and the way they learn.

Research has shown that in order to truly “learn”

SAMPLE COMPANIES

Pedagogical Innovation

Knewton — Personalizes learning in digital classes. An algorithm determines what students know, and how each student learns best.

Pearson — Has created a number of self-paced online “labs” to accompany instruction in courses.

a topic, many students must “experience” it in several different ways, including solving problems, engaging in dynamic discussions, and impromptu quizzes and writing assignments.

Some institutions have begun experimenting with techniques like flipped classrooms and using social media for polling and real-time feedback, and even semester-long [Twitter role-playing](#). But many colleges and universities have resisted changes, defaulting to the large-lecture and discussion-group (or lab) approach to instruction.

The dazzling possibilities of adaptive learning and big data have new companies scurrying to refine smart learning tools and algorithms, using predictive modeling to determine which students need interventions, and what kind of interventions are most likely to work.

Career Direction for the Disaffected & Defining What Employers Want

Millions of American workers can't get a promotion or a better job without more education. At the same time, employers say they [can't find college graduates who have the requisite skills](#) to fill entry-level positions.

How can the two trends be reconciled? Many would-be students who want to get ahead don't know where to start — first-year experience programs have become standard at elite schools, while at most public universities and community col-

SAMPLE COMPANIES

Workplace

Koru — Puts college graduates into real work environments with coaches and mentors to teach them workplace skills.

WorkAmerica — Recruits unemployed and under-qualified candidates and works with colleges to get them trained for new technical careers.

Enstitute — Places millennials in paid, professional apprenticeships.

leges, guidance is transactional at best, and often an unfunded mandate. When advising does occur, the college professors often assigned to advise

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students are not equipped to prep them for the job market. Employers report that would-be workers have the required degrees but lack attributes like ability to work in groups, communication skills, and emotional maturity. They are looking to colleges to be more like placement firms, sending them young, energetic, skilled workers who they can plug in more quickly.

Entrepreneurs are filling these gaps with online student guidance and with school-to-work training programs.

Eight Growth Areas

Within those larger areas and sometimes combining them, the following are the ideas that could best unleash the promise of the learner revolution. All these areas are focused on assuring the success of individual students. Companies are already hard at work in each of these areas, but many are at an early stage. Further innovation and investment is needed in all of them:



credit portability

Credit portability: Rather than leaving it to chance that an institution will accept prior credits, a system must be developed that will ensure seamless and transparent agreement that credits earned at one institution are the equivalent of credits earned at another.



21st century skill assessment

21st century competency assessments: A person's curriculum vitae or experience portfolio will include not only academic credits and certificates, but also credentials demonstrating other skills and attributes that a person possesses and intentionally develops. While many start-up companies help individuals assemble online portfolios, the looming unsolved issue is agreement on metrics for measuring skills in such areas as critical thinking, team building, and even creativity.



competency-based credit

Transparent competency-based credit systems: A number of universities are starting programs giving students credit for what they already know. As this grows, the questions surround consistency. Will Western Governors University, for example, give credit for the same skills in the same way as the University of Wisconsin? How can this process be visible and documented?



personal learner coaching

Personal learner coaching: Much like a financial adviser gives counsel on a variety of financial matters, and a personal trainer on fitness, many adults could use a career adviser to set strategies for them

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to acquire the right skills to get a promotion, a new job, or to switch careers. Companies that can do this en masse but in a personalized way — using data analytics and mobile platforms — could see large opportunities, particularly as learners become free agents, selecting experiences and courses from multiple institutions.



facilitated peer learning

Facilitated peer-learning groups: Online learning has created untold opportunity for anyone who wants to learn a subject to be able to do so. But it is a rare student who is able to master a subject using online learning alone. Most learners need to work in groups in addition to online instruction. Solitary online learners, however, usually don't have readily-identifiable peer groups. Innovations are needed that will bring these students together, online and in-person, so participants can learn from one another.



real-world learning labs

“Real-world” learning labs: How is the learning that takes place in the classroom translated to the larger world? Students might “learn” a topic or concept in a classroom or discussion group, but not fully understand it before they put the knowledge into practice on a real project in the world. Companies and academies are looking to create and credential these opportunities for the “living/learning experience” on a scale much broader than internships or study abroad programs.



skills-specific academies

Skill-specific academies and boot camps: For decades, programs have existed to train people in mostly blue-collar professions, like how to maintain air-conditioning systems or be an auto mechanic. More recently, academies have grown up around computer coding — a growing profession where a college degree is not necessarily a ticket to success. What other professions or skills can be disrupted by a third-party skills academy that bypasses the traditional higher-education system?



adaptive learning & feedback

Adaptive-learning content and feedback: This work is only in its infant stages, and the possibilities for creating new approaches to accommodate different learning styles seem almost limitless. K-12 education is further ahead in using data-driven instruction and real time feedback to shift and personalize instruction. The content is coming for higher ed; the question will be how instructors can integrate it.



Note that these innovations are mostly outside the traditional higher-education system. The opportunities, however, exist for any players who see the future. The colleges and universities within the system are going to have to make a choice. Unless they are heavily endowed or have rock-solid foundations for research, many

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institutions already realize they need a value proposition that will make sense after the learner revolution. In most cases, it may need to be more narrow than the current full-service models.

How are investors currently viewing the higher-education market?

Some reports indicate that while investment in education technology companies will be at its highest point ever in 2014, interest in [further investment is beginning to cool](#). Interest in the sector reached a boiling point in November 2012, when a New York Times headline declared [“The Year of the MOOC.”](#) Money has poured into the largest MOOC companies — Coursera, EdX, and Udacity — but all of them are still struggling to find a business model. Investor returns have not been as spectacular as perhaps promised. As higher education has continued to evolve, it is clear that MOOCs were maybe a gateway drug, but won't be at the center of the industry as it moves forward.

Burck Smith, founder of Straighter Line, a venture-backed company that offers low-cost college-level courses, summarizes the feeling of a lot of investors and educational entrepreneurs when he says, “Everyone sees how broken higher education is, and what a bubble it is, but no one knows how to break it.”

With that level of disappointment, is there much chance that investors will open their eyes wider and embrace companies that focus on the learner-driven revolution rather than the tech revolution?

“Companies pretty routinely come to us and say ‘We have a magic solution and all we need is mon-

ey for sales and marketing,’” said Hoehn-Saric. “I am more skeptical of ideas that claim to replace the traditional system. Higher education is not a free market.”

Craig, of University Ventures, said, “Until there is a clear revenue model, I am not interested.”

In order to get attention from investors, start-up companies need to show:

1. Ability to scale
2. Proof of efficacy
3. ROI — more specifically, promise of above market returns within a five-year time frame.

Companies seeking to prove that a concept improves student learning or outcomes often need data, but concepts must be tested in the field and collecting data may take a long time (years in some cases). Therefore, it is hard to reach any of the three thresholds investors are looking for. There is also the tension between a) the scale challenge inherent in an external disruption strategy, and b) working incrementally inside the system to make it better. Thus far, most of the investment has been going to companies that are partnering with colleges and universities to take over existing systems or to make systems better. They are relatively conservative ideas, but they have worked because colleges are willing to pay for the service, and revenue streams are immediately obvious.

Foment for change continues in higher education, however. The earliest innovative companies in higher education, such as Blackboard, incubated the ideas of a new generation of entrepreneurs who see the possibilities in the sector, said Erik Heyer, founder and chairman of Capital Education

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Group, which has started several Washington, DC-area schools for students with learning disabilities, and former entrepreneur-in-residence at the Education Design Lab.

Some investors believe that mass outside investment in higher education is just beginning.

“We definitely like to say we are still in the bottom of the first inning, though I don’t know how much longer we can say that with so much money flooding into the sector,” said Michael Staton, a partner at Learn Capital, a venture capital fund. “Educational outcomes that will be transformational — we haven’t even scratched the surface yet.”

Ryan Craig, of University Ventures, says higher education, a \$500 billion-a-year industry, outsources less than 10 percent of its services. He expects that figure to grow exponentially in years to come. In order to survive, universities will have to more closely consider working with outside companies on some of their most core functions around learning and student counseling.

Staton said much of the innovation is happening without traditional colleges’ and universities’ involvement, primarily because of the way those institutions are structured. “Outside of the president and provost, how many people have responsibility for student completion in their job description?” he said. “If that’s the biggest problem on campus, and it is, make it part of someone’s job description to change it. If someone is charged with buying solutions, you will see software models pop up all over.”

While some larger venture capital partners may be looking askance at ed tech, other sources of capital are starting to appear. Some existing large players

are slowly moving into student success issues. [For example](#), Flat World is investing in competency-based education and adaptive learning. D2L (formerly Desire 2 Learn) is increasing its focus on personalized learning.

The educational reform behemoth, the Gates Foundation, is going to be more than just a grant-maker going forward. “We’re working to create a more comprehensive strategy for post-secondary venture investing,” said Jason Palmer, Deputy Director for Postsecondary Success at the Foundation. He said the foundation will sometimes be a “co-investor” with venture capital in evidence-backed innovations that the foundation believes could be transformational.

“We see the foundation’s role as very much to complement and catalyze the venture market,” Palmer said. “We want to see investors more focused on evidence-based products and solutions that benefit low-income students.”

Direct investment is a significant change in approach for the Gates Foundation. Up to now, the foundation has only directly invested in two ed tech companies. The change, perhaps, reflects some impatience with the pace of change when there is too much reliance solely on the investment community.

“Venture firms are good at looking for scalable, consumer-oriented business models,” Palmer said. “But education in postsecondary is predominantly delivered through 4,000 colleges and universities. The Postsecondary Success strategy invests in partners who are working to solve today’s biggest problems in higher education — working in partnership with institutions.”

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The foundation is interested in the best ideas, supported by evidence, not just the business models — a strategy that may allow more start-up companies to take flight.

Meanwhile the small companies working on the “hard stuff” continue to struggle. “Anyone in education knows to get something to scale can take ten years,” said Wattenmaker of csMentor.

Van Pelt, of Course Maven, said the change she needs to succeed is “going to start with smaller companies saying I need 15 percent more employees with specific skills. It’s unrealistic to think the traditional higher-education system, as it exists, can produce those graduates quickly. So I start working with a college to create a program to do that, and I find new employers to help me grow my business. That’s how the change is going to occur and then it’s going to bubble up through the system.”

The nonprofit **Education Design Lab** works with learning institutions, entrepreneurs and government to create and test new models for post-secondary education, the school to work pipeline and lifelong learning.

This report was written by Washington-based freelance writer **Martin Van Der Werf**. He is a former reporter and editor at The Chronicle of Higher Education. He blogs at [The College of 2020](#).

